CLAIM

1. A method for processing a digital signal on a frame-wise basis, comprising the steps of:

(a) modifying a sample sequence of a frame neighboring its first sample and/or a sample sequence of said frame neighboring its last sample in accordance with a consecutive-sample sequence consisting of consecutive samples forming part of said frame, thereby forming a modified sample sequence; and

(b) processing a series of sample sequence of said frame over said modified sample sequence.

2. The digital signal processing method of claim 1, wherein said step (a) includes a step of concatenating an alternative sample sequence, formed by using said series of sample sequences, to the front of the first sample of said frame and/or to the back of the last sample of said frame, thereby forming said modified sample sequence.

3. The digital signal processing method of claim 2, wherein said step (a) includes a step of providing said alternative sample sequence by reversing the order of arrangement of samples of said consecutive-sample sequence.

4. The digital signal processing method of any one of claims 1, 2 and 3, wherein said step (a) of modifying a partial sample sequence in said frame containing the first sample and/or partial sample sequence in said frame containing the last sample by a calculation with said consecutive-sample sequence, thereby forming said modified sample sequence.

5. The digital signal processing method of claim 4, wherein said step (a) includes a step of concatenating a predetermined fixed sample sequence to the front of the first sample of said frame and/or to the back of said last

sample.

6. The digital signal processing method of any one of claims 1, 2 and 3, wherein the processing by said step (b) is linear prediction error generating processing for a sample sequence.

7. The digital signal processing method of any one of claims 1, 2 and 3, wherein the processing by said step (b) is FIR filter processing for a sample sequence.

8. The digital signal processing method of claim 2 or 3, which further comprises a step of providing, as a part of a code for the digital signal of said frame, auxiliary information indicating any one of a plurality of methods for using said consecutive-sample sequence as said alternative sample sequence and/or indicating the position of said consecutive-sample sequence

9. The digital signal processing method of claim 1, wherein:

said step (a) includes: a step of retrieving a sample sequence similar to a leading sample sequence or rear-end sample sequence of said frame and using said similar sample sequence as said consecutive-sample sequence; and a step of multiplying said similar sample sequence by a gain and the multiplied output is subtracted from said leading or rear-end sample sequence to form said modified sample sequence;

said step (b) a step of performing said processing to calculate a prediction error of the digital signal of said frame; and a step of providing, as a part of a code of said frame, auxiliary information indicating the position of said similar sample sequence in the frame and said gain.

10. The digital signal processing method of claim 1, wherein said step (a) includes the steps of:

(a-1) reconstructing the sample sequence of said frame by autoregressive prediction synthesis from a prediction error signal obtained

from a code, and replicating said consecutive-sample sequence at the position in said frame specified by auxiliary information provided as part of said code; and

(a-2) multiplying said replicated sample sequence by a gain in said auxiliary information and adding the multiplied output to the first or last sample sequence of said frame to provide said modified sample sequence.

11. A digital signal processing method that performs filter or prediction processing of a digital signal on a frame-wise basis, comprising the step of:

(a) processing said digital signal by use of a tap number of prediction order dependent only on usable samples in a frame without using samples preceding a first sample of said frame and/or samples succeeding a last sample of said frame.

12. The digital signal processing method of claim 11, wherein said step (a) includes the steps of:

(a-1) at least one of steps of: processing said digital signal while increasing the tap number or prediction order progressively in correspondence to samples from the front position of said frame to a predetermined first sample position; and decreasing said tap number of prediction order progressively for each sample from a predetermined second position behind said first position to the last position; and

(a-2) processing said digital signal while maintaining the tap number of prediction order unchanged for samples that are not subjected to the processing by said step (a).

13. The digital signal processing method of claim 11 or 12, wherein said processing is FIR filter processing.

14. The digital signal processing method of claim 14, wherein said

processing is autoregressive linear prediction error generation processing.

15. The digital signal processing method of claim 14, wherein said autoregressive linear prediction error generation processing is an operation using PARCOR coefficients.

16. A digital signal processing method that is used in frame-wise coding of an original digital signal and performs processing by use of samples of a frame preceding or/and succeeding the frame concerned, said method comprising the step of:

coding the first sample sequence of the frame concerned or the last sample sequence of said preceding frame separately of coding of said frame concerned, and providing auxiliary information as part of the code of said frame concerned.

17. The digital signal processing method of claim 16, wherein said processing is linear prediction of an input signal to generate a prediction error signal.

18. The digital signal processing method of claim 16, wherein said processing is FIR filtering of an input signal.

19. A digital signal processing method that is used in frame-wise decoding of an encoded code of an original digital signal and performs processing by use of samples of a frame preceding or/and succeeding the frame concerned, said method comprising the step of:

(a) decoding an auxiliary code of said frame to obtain a first sample sequence of said frame or the last sample sequence of the preceding frame; and

(b) processing, for said frame, said first or last sample sequence as a decoded sample sequence at the end of the preceding frame.

20. The digital signal processing method of claim 19, wherein said

processing of said step (b) is processing for generating a prediction synthesis signal by performing linear prediction synthesis of an input error signal.

21. The digital signal processing method of claim 19, wherein said processing of said step (b) is FIR filtering.

22. A processor for processing a digital signal on a frame-wise basis, comprising:

means for forming a modified sample sequence by modifying a sample sequence of a frame neighboring its first sample and/or a sample sequence of said frame neighboring its last sample by using a consecutive-sample sequence consisting of consecutive samples forming part of said frame; and

means for processing said digital signal over said modified sample sequence.

23. The digital signal processor of claim 22, wherein:

said modified sample sequence forming means includes: means for generating, as an alternative sample sequence, a consecutive-sample sequence consisting of consecutive samples forming part of the frame; and means for concatenating said alternative sample to at least one of the front of the first sample of the digital signal of the frame concerned and the back of the last sample of said digital signal of said frame; and

said processing includes means for performing linear coupling of the digital signal having concatenated hereto said alternative sample sequence.

24. The digital signal processor of claim 22, wherein:

said modified sample sequence forming means includes: means selecting a consecutive-sample sequence, which consists of consecutive samples forming part of said frame, similar to the first or last sample sequence of the frame; means for multiplying said selected consecutive-sample

sequence by a gain; and means for subtracting said gain-multiplied consecutive-sample sequence from the first or last sample sequence of said frame; and

said processing means includes: means for generating a prediction error of the digital signal of said subtracted frame by autoregressive prediction; and means for providing, as a part of code of the current frame, auxiliary information indicating the position of said consecutive-sample sequence in said frame and said gain.

25. The digital signal processor of claim 22, which further comprises:

means for reconstructing a sample sequence of one frame by autoregressive synthesis filter on the basis of a prediction error signal obtained from a code; means for extracting the consecutive-sample sequence from said reconstructed sample sequence on the basis of position signal in auxiliary information used as a part of a code of said frame; means for multiplying said extracted consecutive-sample sequence by a gain contained in said auxiliary information; means for forming said modified sample sequence by adding said gain-multiplied consecutive-sample sequence to the first or last sample sequence of said reconstructed sample sequence; and

said processing means is means for performing autoregressive prediction synthesis for the digital signal over said modified sample sequence.

26. A program for executing by a computer respective steps of said digital signal processing method of any one of claims 1 to 21.

27. A readable recording medium having recorded thereon a computer-executable program of said digital signal processing method of any one of claims 1 to 21.